

**Habitat use and movements of juvenile  
Chinook salmon in south Lake Washington,  
2003 investigations**



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## **Background**

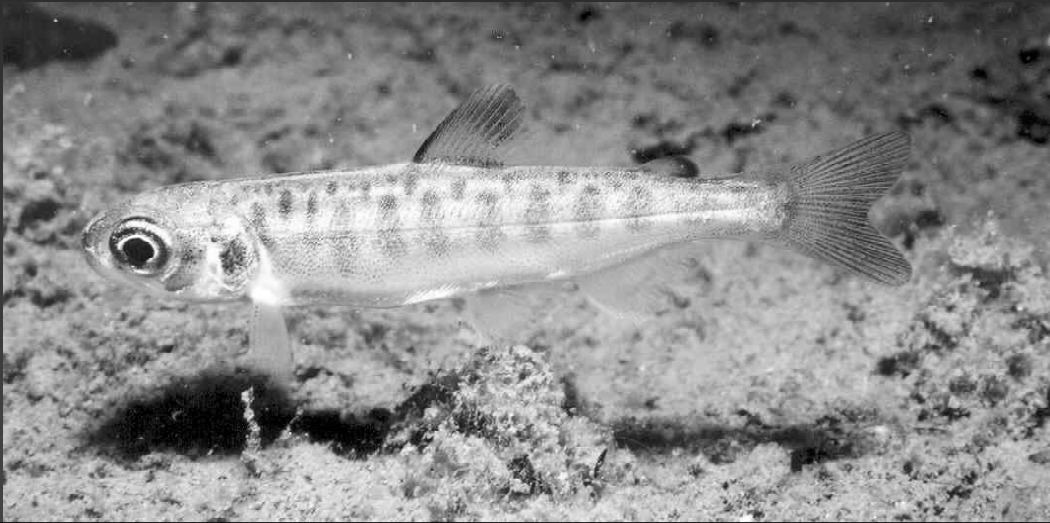
- **Juvenile Chinook inhabit the nearshore area from February to mid-May**
- **Prefer shallow water with a gentle slope and small substrate**
- **Active during the day and sometimes use overhead cover especially when small**
- **At night are inactive, rest on the bottom away from cover**
- **After mid-May move into deeper water but little is known about their habitat use**

## **Study Elements - 2003**

- **Index sites - temporal and spatial distribution**
- **Small woody debris and overhanging vegetation experiment**
- **Residence time**
- **Johns Creek - nonnatal tributary**
- **Microacoustic tracking**

# **Index sites**

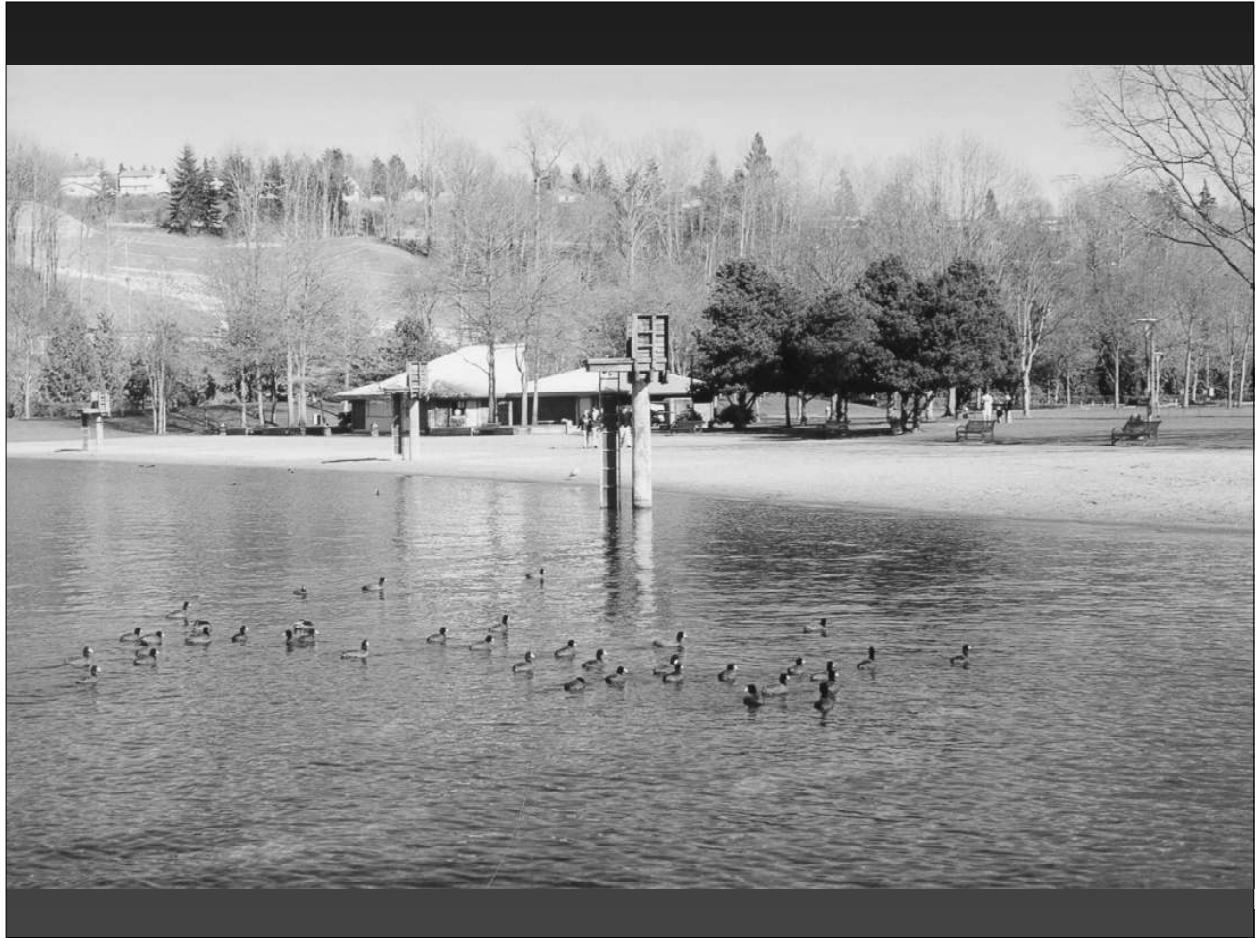
**Objective: Examine temporal and spatial  
distribution of Chinook salmon in south  
Lake Washington**

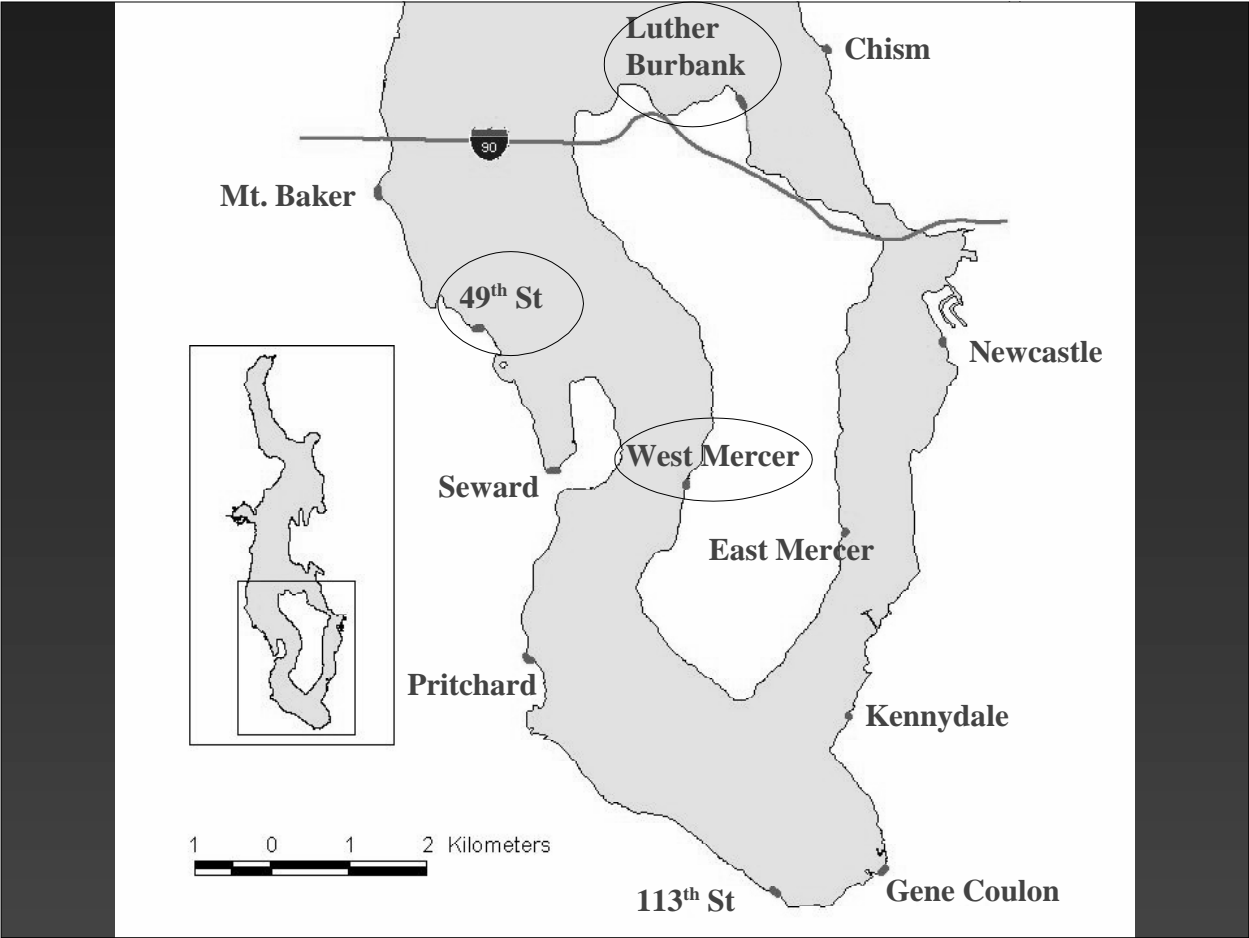




# Index Sites

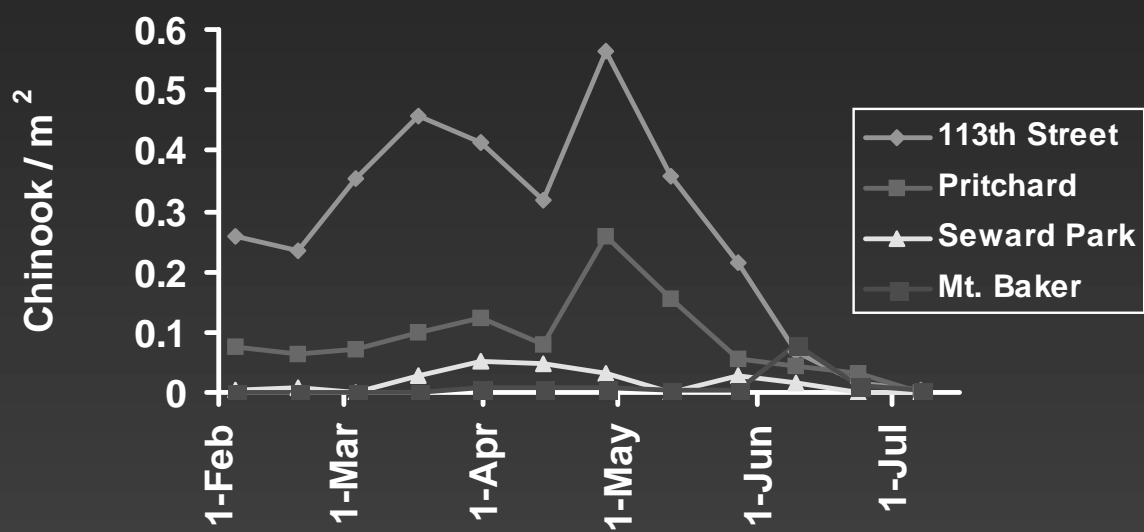
- **Selected high-quality sites (gentle slope with sand/gravel substrate)**
  - 4 along west shoreline (5 in 2002)
  - 4 along east shoreline
  - 1 on Mercer Island (3 in 2002)
- **Night snorkeling along two depth contours – 0.4 and 0.7 m depth**
- **Surveyed once every two weeks from February to July**
- **Index sites also surveyed in 2002**





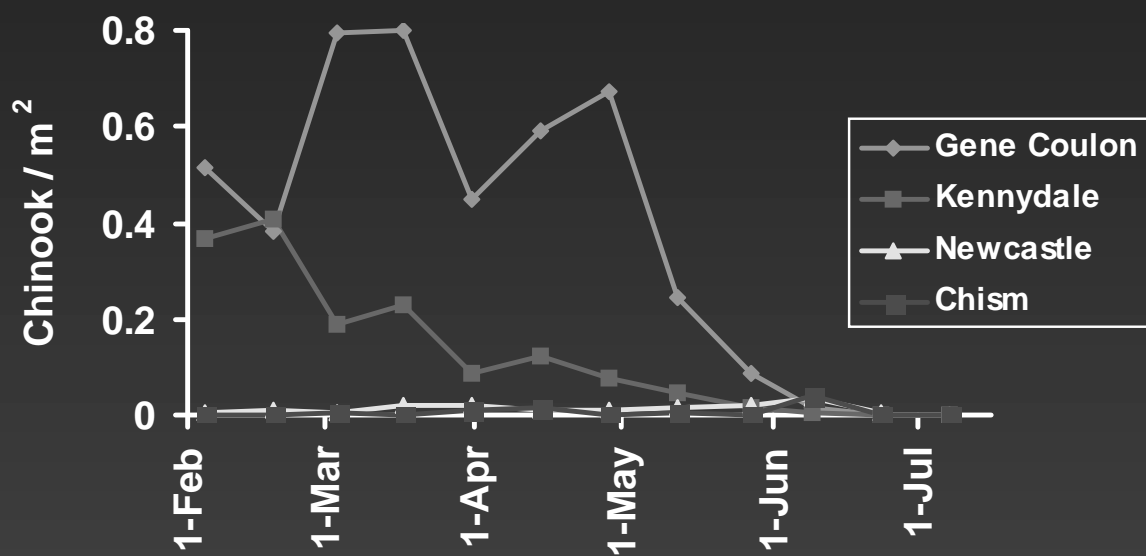
# Index Sites

## West shoreline



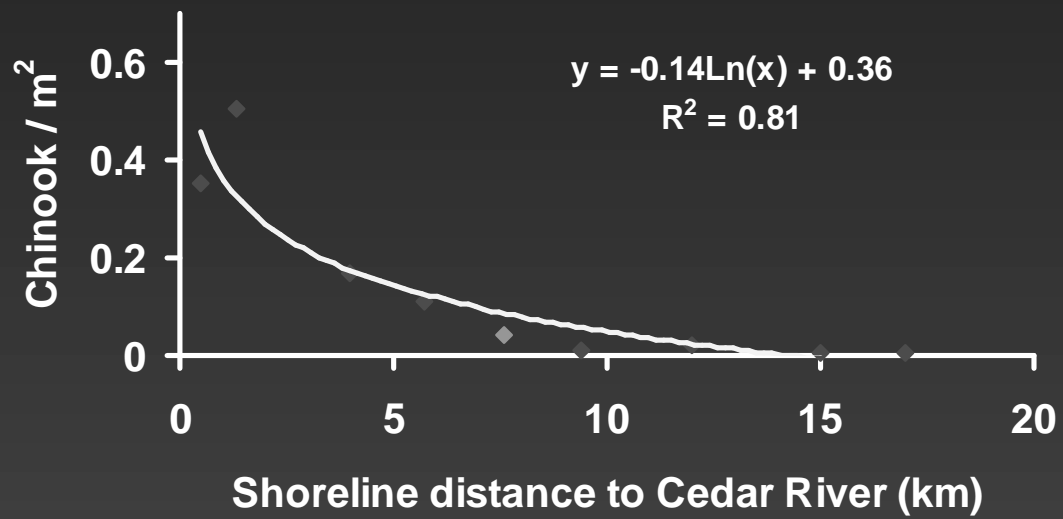
# Index Sites

## East shoreline



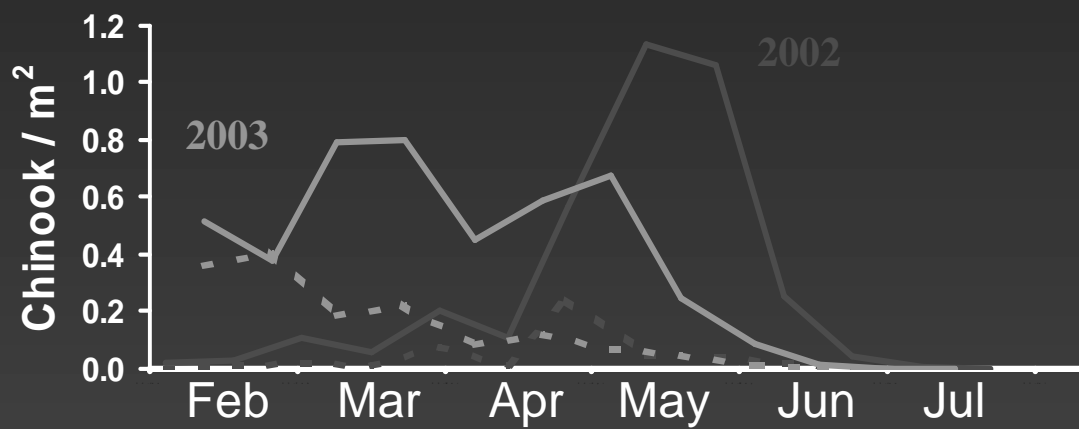
# Index Sites

February 4 – May 27



# Index Sites – 2002 and 2003

## East shoreline



# **Small Woody Debris and Overhanging Vegetation Experiment**





# Natural SWD/OHV sites

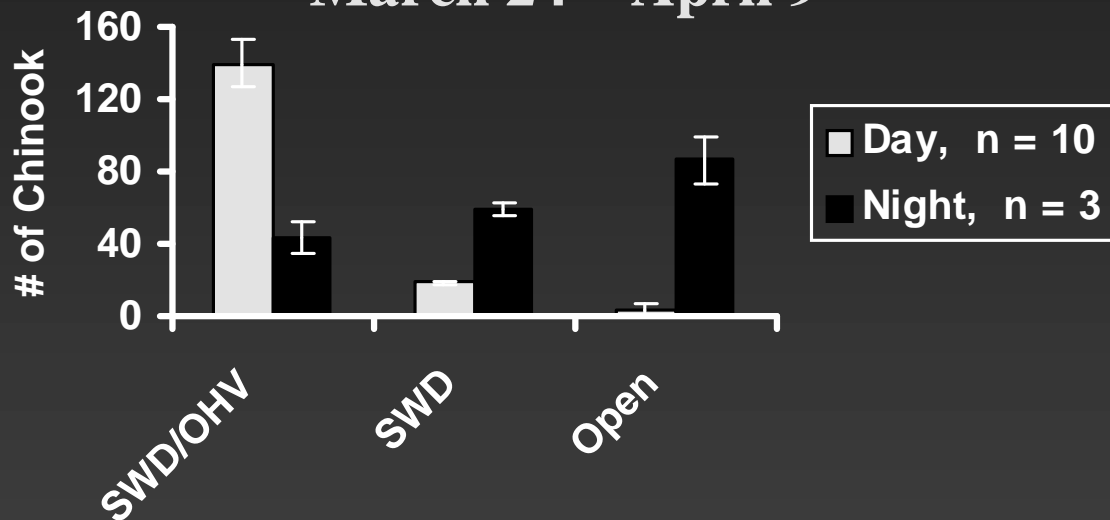


## **Small Woody Debris and Overhanging Vegetation Experiment**

- **Conducted in Gene Coulon Park where Chinook salmon were abundant**
- **Shoreline divided in six 15-m sections**
- **2 shoreline sections with SWD/OHV, 2 with SWD only and 2 were open**
- **Two time periods: once from late March to early April and again in early May**



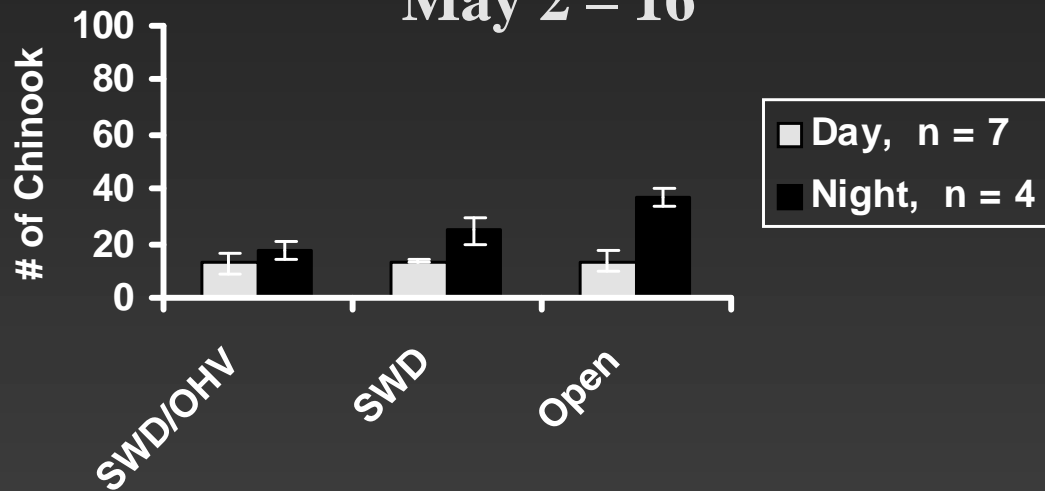
## SWD and OHV Experiment March 24 – April 9



Mean length, March 24 = 44 mm FL



## **SWD and OHV Experiment May 2 – 16**



**Mean length, May 8 = 70 mm FL**

# Lake Quinault



# Lake Quinault





# Residence time

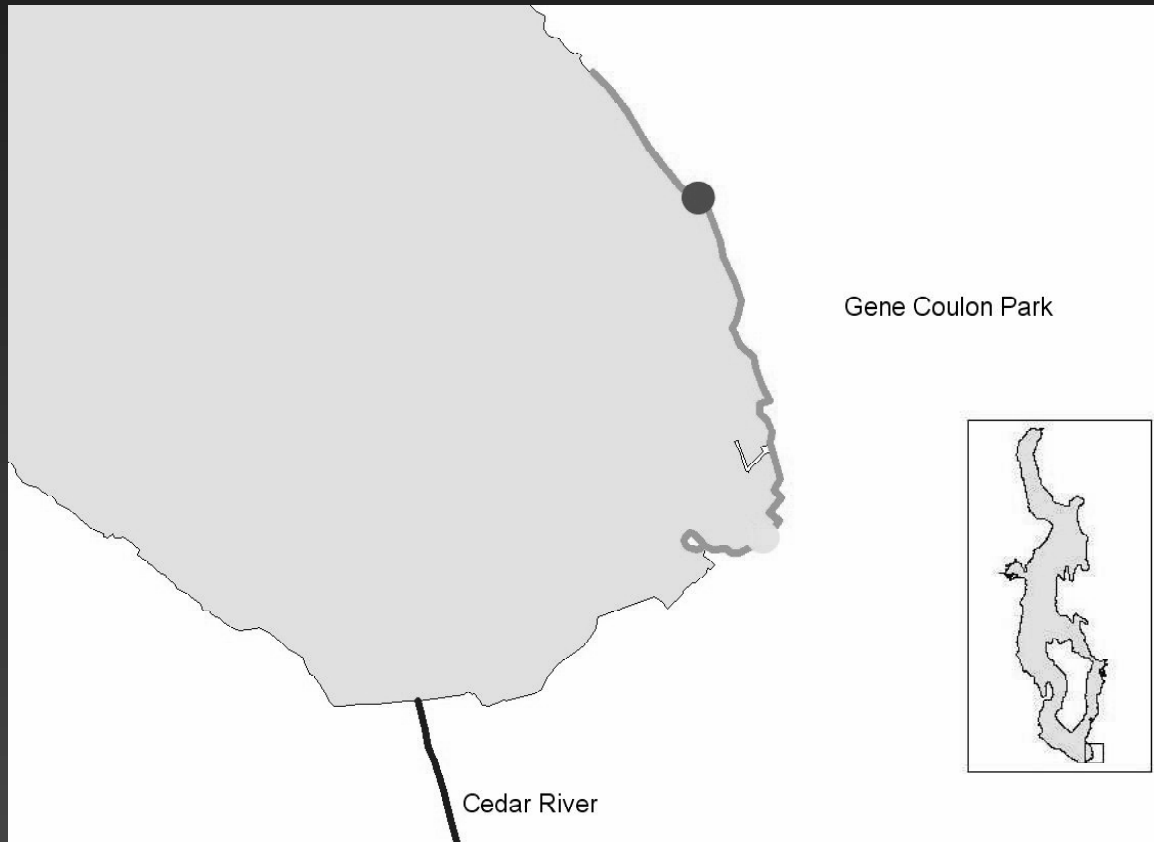
**Objective: Determine the residence time and movements of Chinook salmon in south Lake Washington**



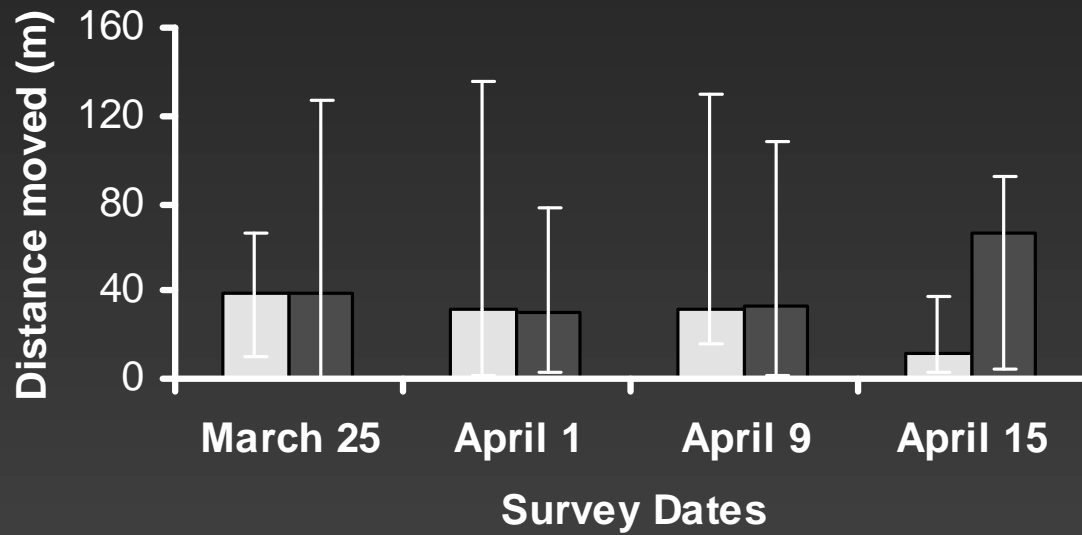
## **Residence Time and Movements**

- **Conducted in Gene Coulon Park where Chinook salmon were abundant**
- **Marked 200 Chinook – 100 (yellow) in south and 100 (red) in north part of the park**
- **Snorkeled the entire park shoreline 1, 7, 15 and 21 days after release**
- **Measured distance moved from release site**

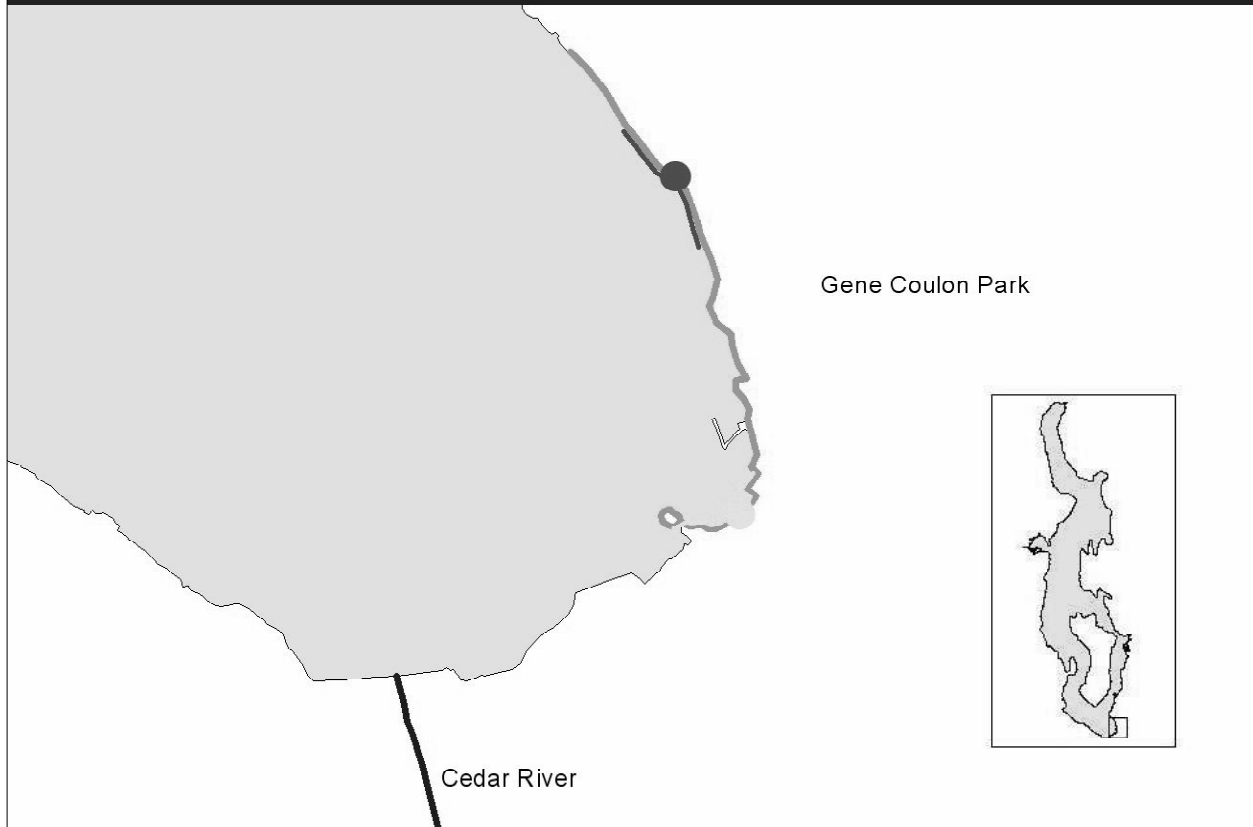
# Release sites and snorkel area



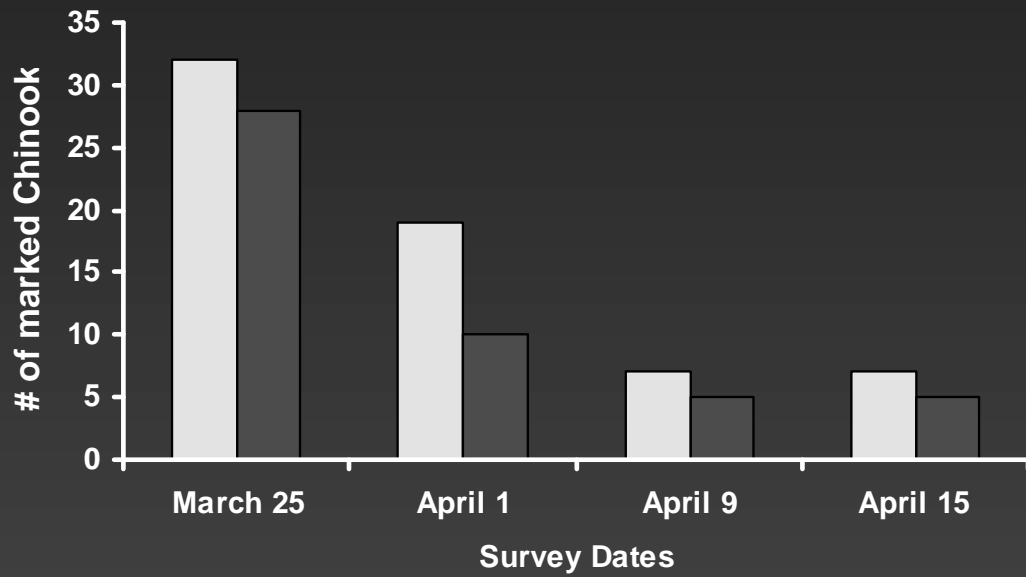
## Distance moved from release site



# Distance moved from release site



## Number of recaptures

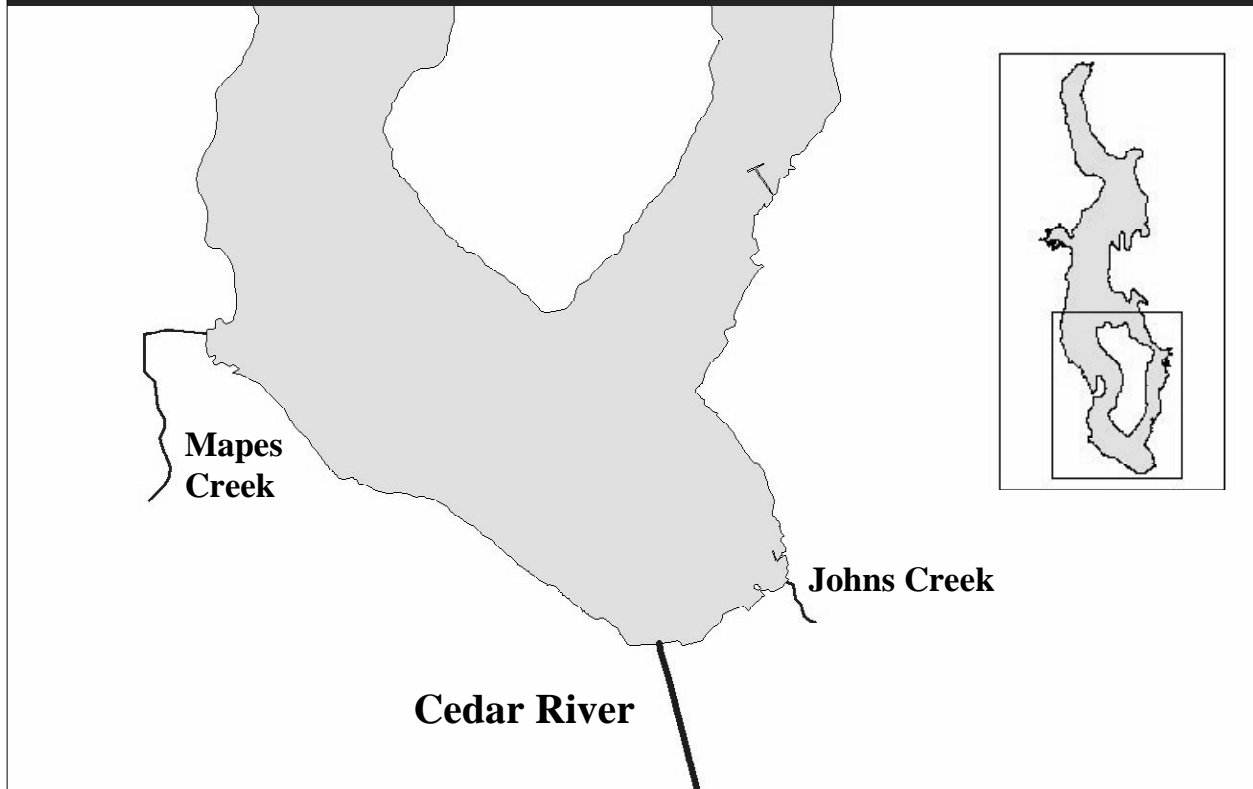


# Johns Creek

**Objective: Determine the abundance and habitat use of Chinook in Johns Creek, a nonnatal tributary near the mouth of the Cedar River**

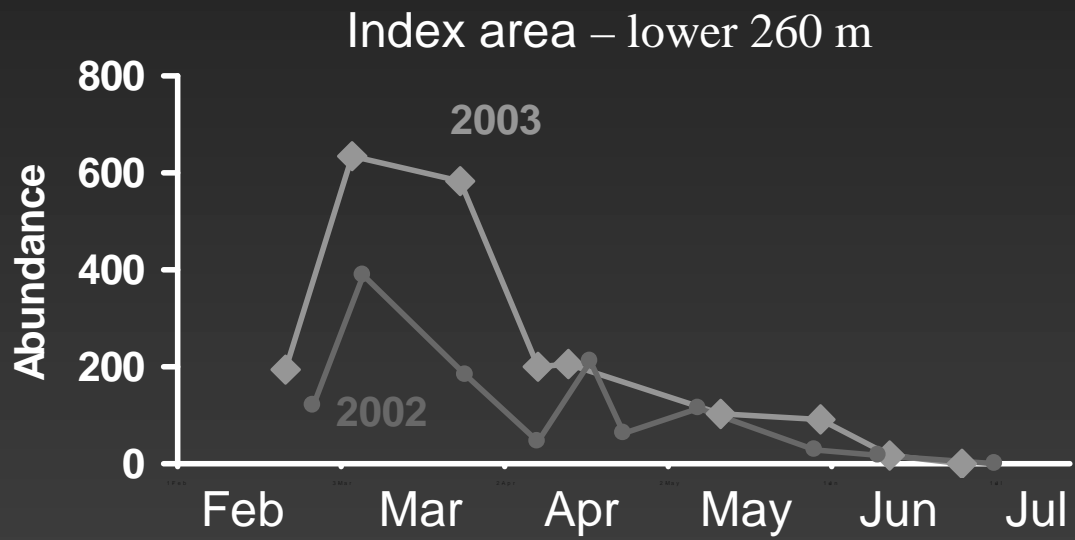


# Johns Creek / Mapes Creek

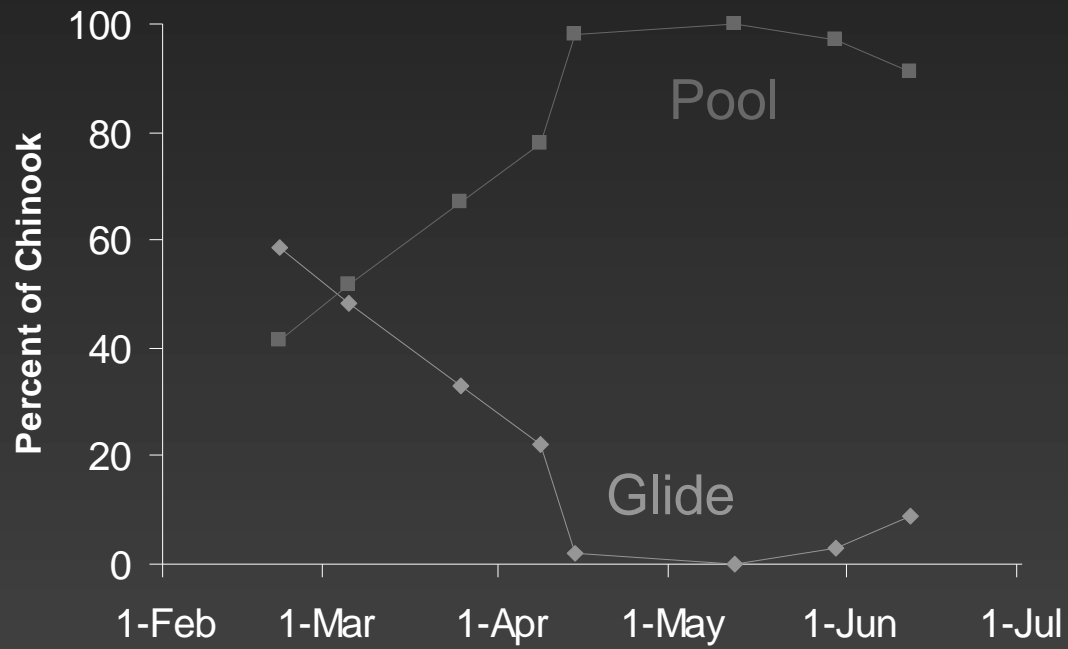




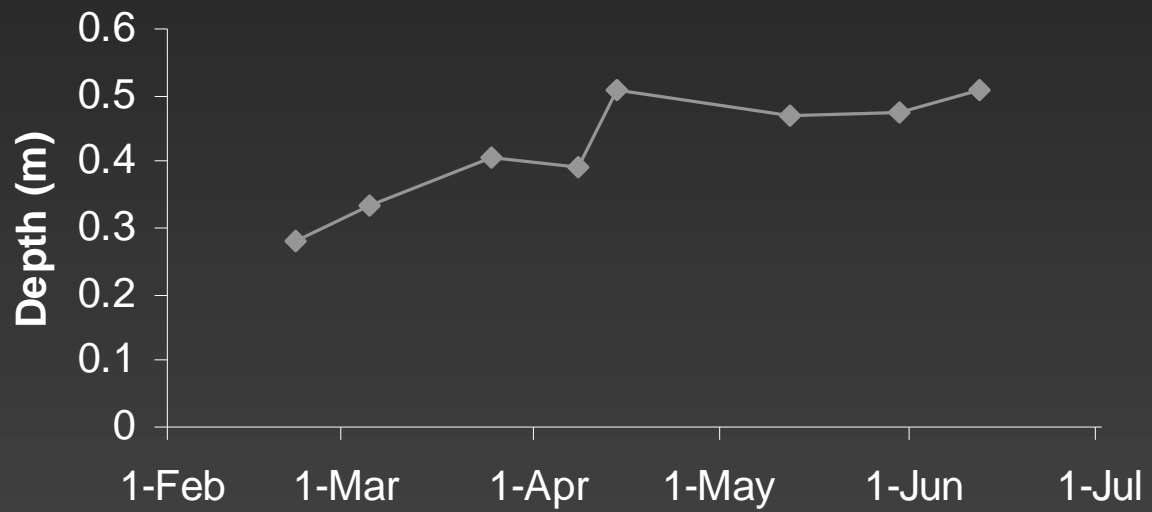
# Chinook Abundance in Johns Creek



## Proportion by Habitat Type



## Mean Water Column Depth of Chinook



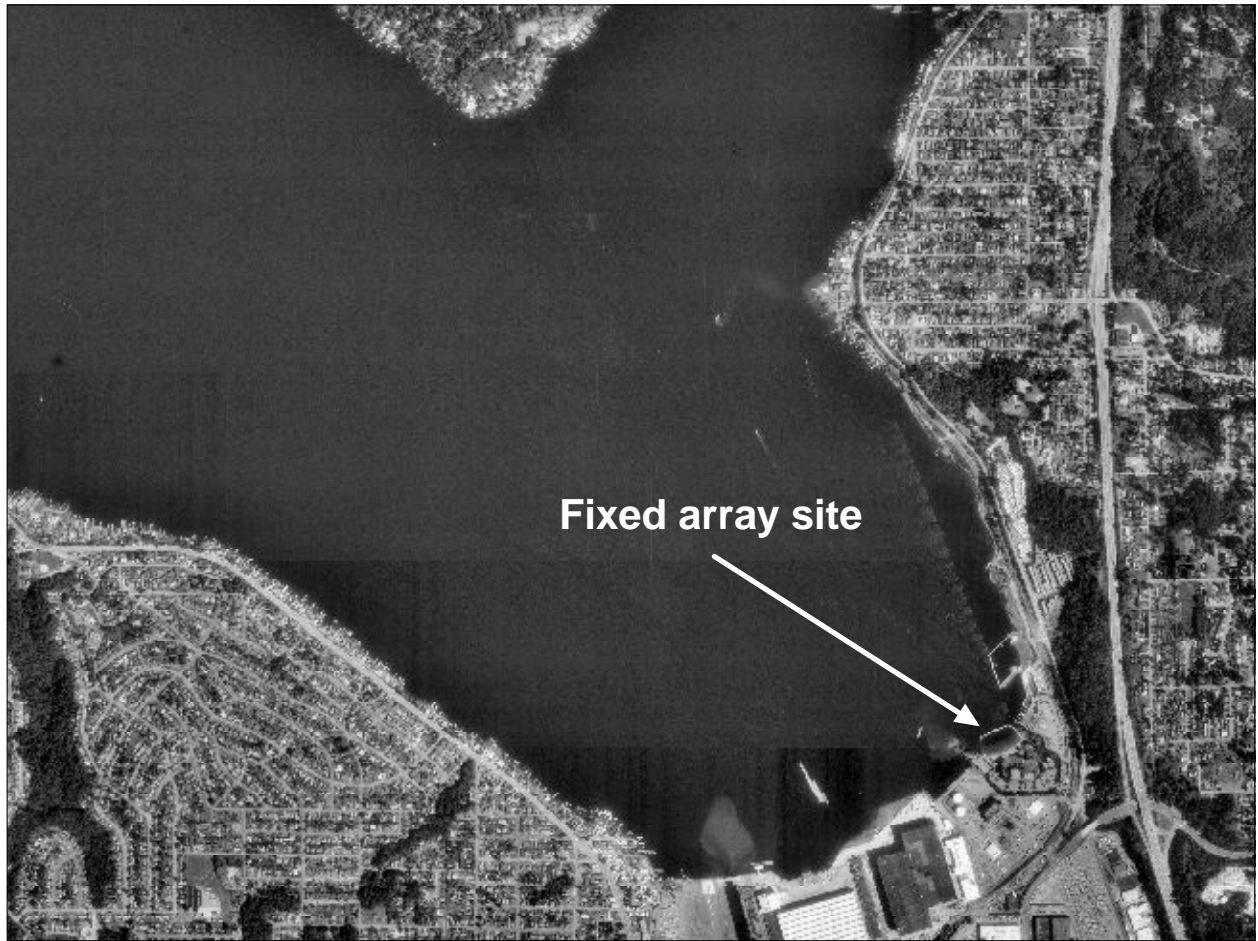
# Microacoustic Tracking

**Objective: Determine the habitat use and diel behavior pattern of Chinook salmon in late May and June**



# **Microacoustic Tracking**

- **Conducted at Gene Coulon Park swim beach**
- **Fixed array along a 150 m shoreline section**
- **Implanted fish with 0.75 g tags**
- **Tracked two fish (94 and 96 mm FL) for 18 hours – May 22-23 (14-16°C)**

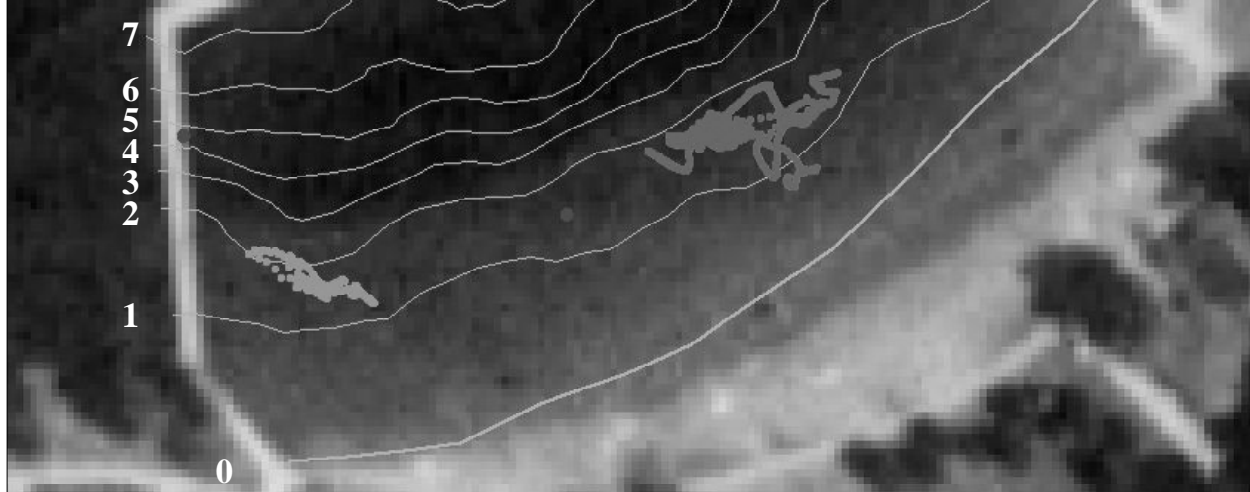


# Microacoustic Tracking

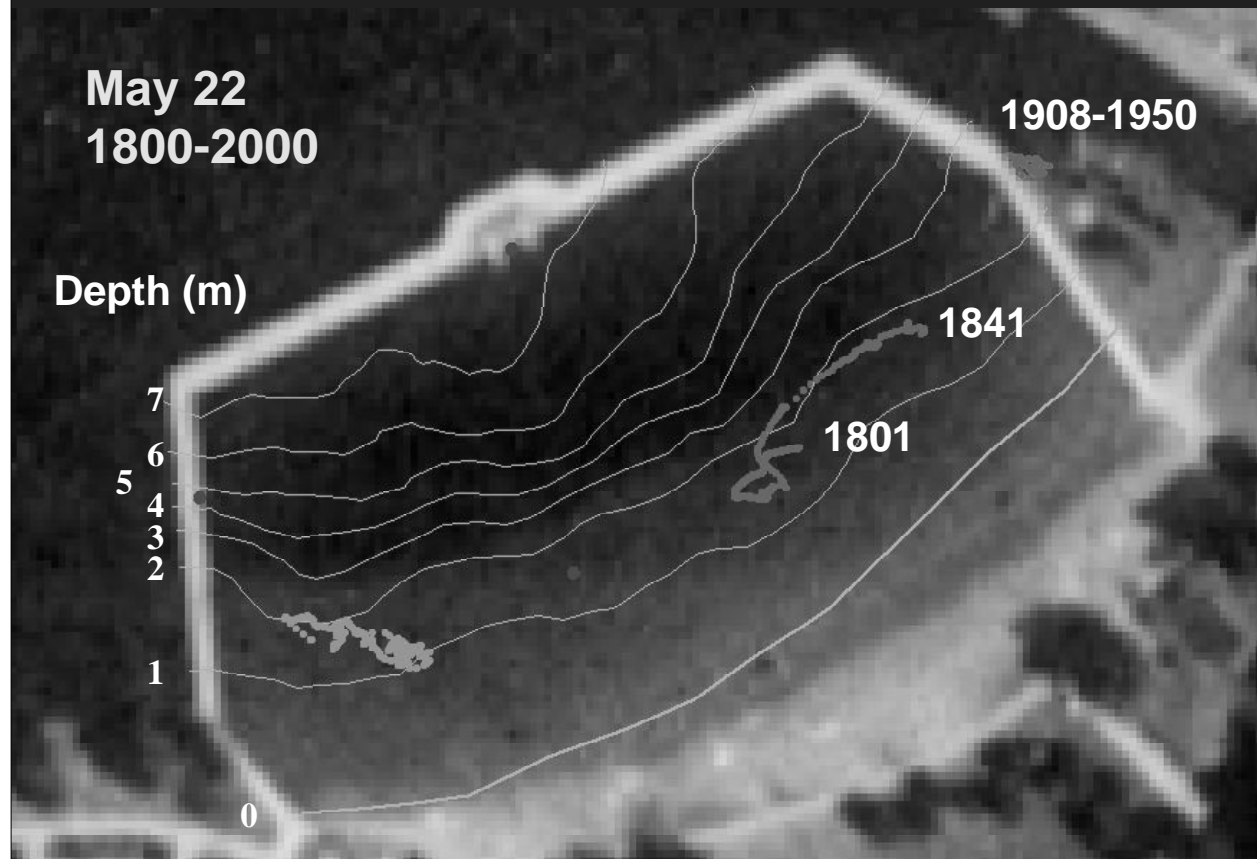
Fish released on May 22 at 1534

1600-1700

Depth (m)



# Microacoustic Tracking





# Microacoustic Tracking

May 23

0200-0300

Depth (m)

7

6

5

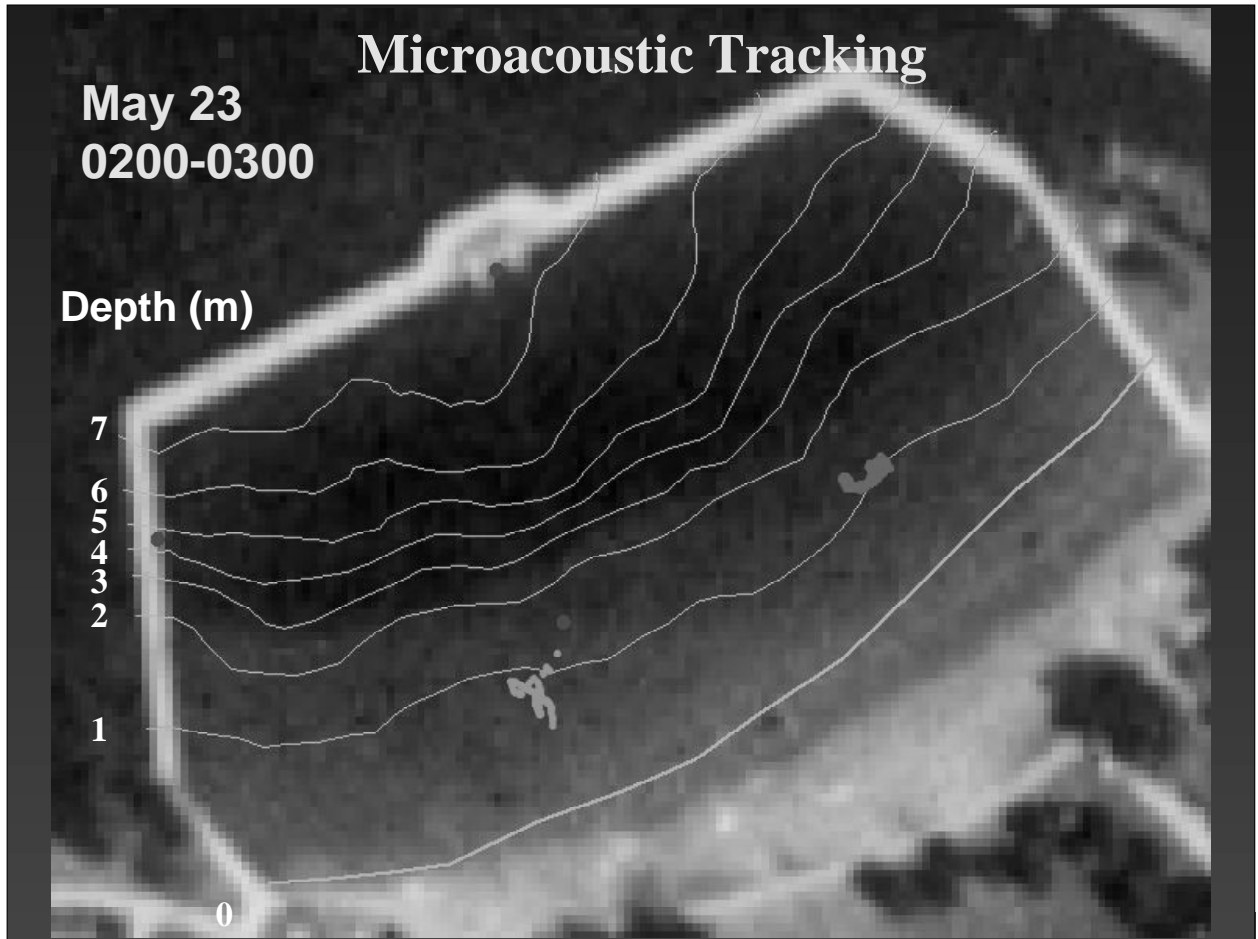
4

3

2

1

0



# Microacoustic Tracking

May 23 0500-  
0600

Depth (m)

7

6

5

4

3

2

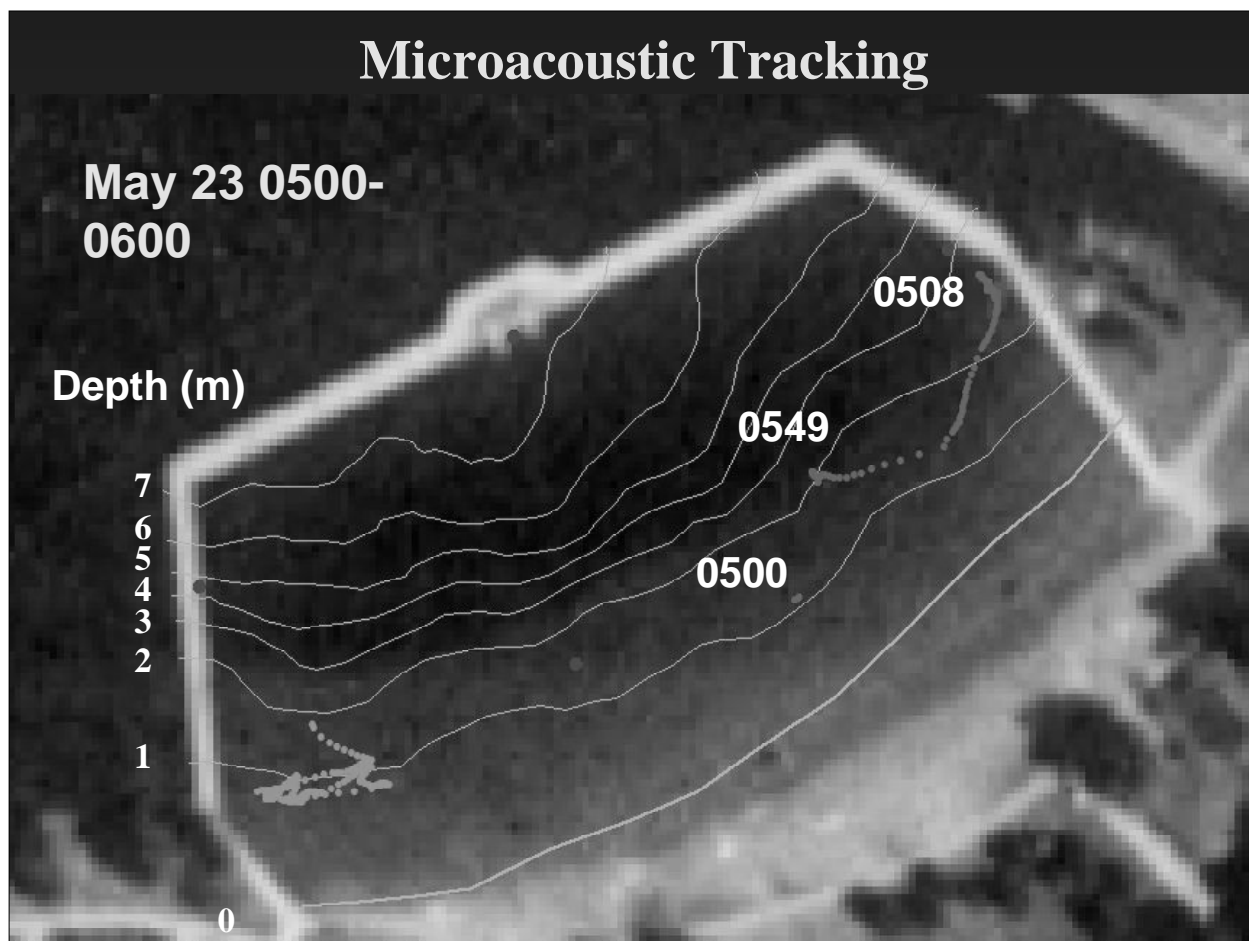
1

0

0508

0549

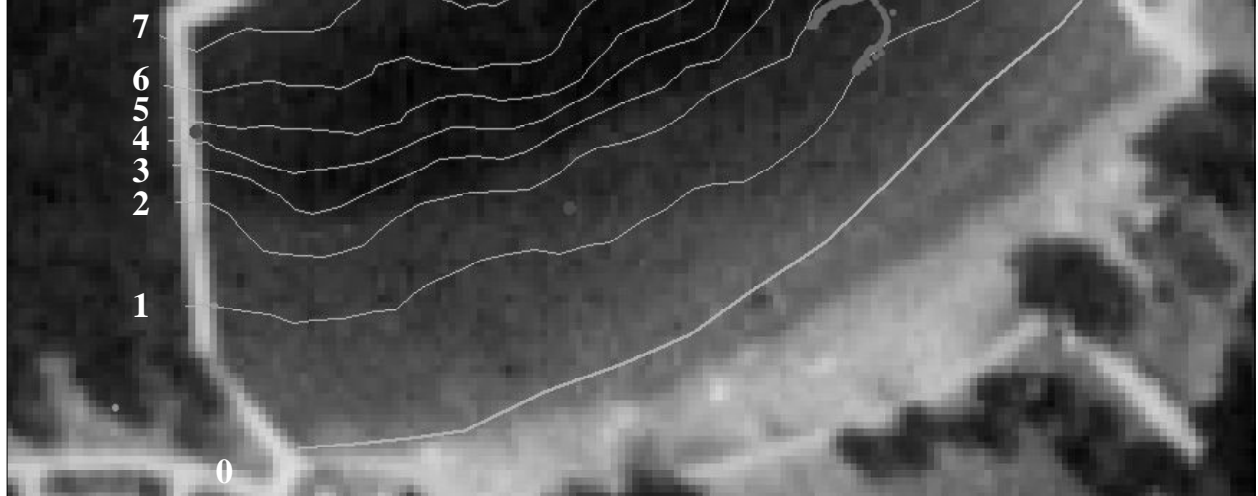
0500



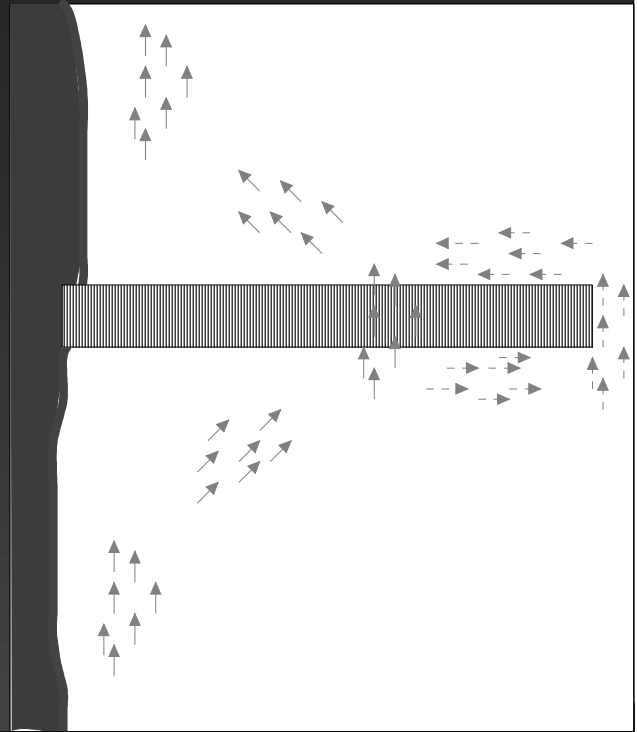
# Microacoustic Tracking

May 23 0700-  
0900

Depth (m)



# How docks affect the shoreline movements of Chinook salmon



# Conclusions

- Chinook were concentrated in the south end from February to May
- Overhanging riparian vegetation appears to be a valuable habitat feature
- Many Chinook remain in the same area for an extended period of time
- Large numbers of Chinook were present in Johns Cr in 2003 and they inhabited progressively deeper areas as they increased in size

## Conclusions, cont'd

- **Tracking of microacoustic tags can provide valuable information on fish habitat but it is limited by fish size and temperature**
- **Tagged Chinook inhabited water that was less than 4 m deep**

